

DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
OFFICE OF STANDARDS SERVICES

COMMERCIAL STANDARD CS218-59

RIGID (ABS) PLASTIC PIPE (IPS DIMENSIONS)

Commercial Standard CS218-59, Rigid ABS Plastic Pipe (IPS Dimensions) was superseded by Product Standard PS18-69, Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Schedules 40 and 80), and withdrawn by the Department of Commerce in September 9, 1974.

Product Standard PS18-69 was replaced by ASTM D1527, Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80. This ASTM standard is under the direct responsibility of Subcommittee F17.27 on Styrene Based Pipe.

The staff manager for ASTM Committee F17 on Plastic Piping Systems can provide technical assistance on the committee's standards activities and contacts for the appropriate subcommittee.

Contact: Committee F17 Staff Manager
American Society for Testing and Materials (ASTM)
1916 Race Street
Philadelphia, Pennsylvania 19103, USA
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General Inquiries and Orders: (215) 299-5585
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* * * * *

The Society of the Plastics Industry, Inc. (SPI) was the sponsor for Commercial Standard CS218-59.

For technical assistance and additional information, contact:

Society of the Plastics Industry, Inc. (SPI)
1275 K Street, NW, Suite 400
Washington, DC 20005, USA
Telephone: (202) 371-5200
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Federal Register



DEPARTMENT OF COMMERCE

National Bureau of Standards

VOLUNTARY PRODUCT STANDARDS

Action on Proposed Withdrawal

In accordance with § 10.12 of the Department's "Procedures for the Development of Voluntary Product Standards" (15 CFR Part 10, as revised; 25 FR 8349 dated May 28, 1970), notice is hereby given of the withdrawal of the following Voluntary Product Standards:

PS 10-69, "Polyethylene (PE) Plastic Pipe (Schedule 40—Inside Diameter Dimensions)".

PS 11-69, "Polyethylene (PE) Plastic Pipe (SDR)".

PS 12-69, "Polyethylene (PE) Plastic Pipe (Schedules 40 and 80—Outside Diameter Dimensions)".

*PS 18-69, "Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Schedules 40 and 80)".

PS 19-69, "Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Standard Dimension Ratio)".

PS 21-70, "Poly(Vinyl Chloride) (PV) Plastic Pipe (Schedules 40, 80, and 120)".

PS 22-70, "Poly(Vinyl Chloride) (PVC) Plastic Pipe (Standard Dimension Ratio)".

This action is taken in furtherance of the Department's announced intentions as set forth in the public notice appearing in the FEDERAL REGISTER of April 18, 1974 (39 FR 13908), to withdraw these standards.

→ The effective date for the withdrawal of these standards will be Sept. 9, 1974. This withdrawal action terminates the authority to refer to these standards as voluntary standards developed under the Department of Commerce procedures.

ERNEST AMBLER,
Acting Director.

JULY 3, 1974.

[FR Doc. 74-15609 Filed 7-6-74; 3:45 am]

FEDERAL REGISTER, VOL. 39, NO. 132—TUESDAY July 9, 1974

COMMERCIAL STANDARD **CS218-59**

**DO NOT REMOVE
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Rigid ABS Plastic Pipe (IPS Dimensions)

**A recorded
voluntary standard of the
trade published by
the U.S. Department
of Commerce**



WITHDRAWN

**For sale by the Superintendent of Documents
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U.S. DEPARTMENT OF COMMERCE

Frederick H. Mueller, Secretary

OFFICE OF TECHNICAL SERVICES

Commodity Standards Division

With the cooperation of
National Bureau of Standards

COMMERCIAL STANDARDS

Commercial Standards are developed by manufacturers, distributors, and users in cooperation with the Commodity Standards Division of the Office of Technical Services, and with the National Bureau of Standards. Their purpose is to establish quality criteria, standard methods of test, rating, certification, and labeling of manufactured commodities, and to provide uniform bases for fair competition.

The adoption and use of a Commercial Standard is voluntary. However, when reference to a Commercial Standard is made in contracts, labels, invoices, or advertising literature, the provisions of the standard are enforceable through usual legal channels as a part of the sales contract.

Commercial Standards originate with the proponent industry. The sponsors may be manufacturers, distributors, or users of the specific product. One of these three elements of industry submits to the Commodity Standards Division the necessary data to be used as the basis for developing a standard of practice. The division by means of assembled conferences or letter reference, or both, assists the sponsor group in arriving at a tentative standard of practice and thereafter refers it to the other elements of the same industry for approval or for constructive criticism that will be helpful in making any necessary adjustments. The regular procedure of the division assures continuous servicing of each Commercial Standard through review and revision whenever, in the opinion of the industry, changing conditions warrant such action.

SIMPLIFIED PRACTICE RECOMMENDATIONS

Under a similar procedure the Commodity Standards Division cooperates with industries in the establishment of Simplified Practice Recommendations. Their purpose is to eliminate avoidable waste through the establishment of standards of practice for sizes, dimensions, varieties, or other characteristics of specific products; to simplify packaging practices; and to establish simplified methods of performing specific tasks.

The initial printing of Commercial Standard CS218-59 was made possible through the cooperation of the Society of the Plastics Industry.

Rigid ABS Plastic Pipe (IPS Dimensions)

[Effective May 1, 1959]

1. PURPOSE

1.1 The purpose of this Commercial Standard is to provide a nationally recognized standard specification for the guidance of producers, distributors, testing laboratories, and users of acrylonitrile-butadiene-styrene plastic pipe (referred to herein as ABS plastic pipe, in accordance with the recommended abbreviations of terms relating to plastics in ASTM Designation: D1600-58T); to promote fair competition between sellers; and to maintain public confidence in the quality of the products of the industry.

2. SCOPE

2.1 The requirements of this standard are applicable to rigid ABS plastic pipe with dimensions corresponding to those used for iron and steel pipe, often referred to as IPS dimensions. It covers requirements and methods of test including composition, dimensions and tolerances, quick burst pressure, sustained pressure, marking and declaration of compliance. The chief characteristics of rigid ABS pipe are strength, dimensional stability, toughness, resistance to chemicals, corrosion, contamination and environmental effects, suitability for electric insulation, low flow resistance, and ease of installation.

2.2 Three classifications of pipe are covered by this standard. Series 40, Series 80, and Series 120.

3. REQUIREMENTS

3.1 COMPOSITION.—The pipe shall be made from polymers and/or blends containing combinations of acrylonitrile, butadiene, and styrene as their principal components.

3.2 Pipe shall be manufactured of virgin material and no scrap material other than clean rework material from the pipe manufacturer's own production shall be used.

3.3 ABS pipe used for conveying potable water shall bear the NSF seal of approval in accordance with requirements of the National Sanitation Foundation, School of Public Health, University of Michigan, Ann Arbor, Michigan.

3.4 COLOR.—The color of the pipe shall be as specified in the contract or purchase order.

3.5 DIMENSIONS AND TOLERANCES.—The outside diameter and wall thicknesses and their tolerances for all series of pipe shall be as specified in table 1 when measured in accordance with paragraph 4.1. If pipe is out-of-round all diameters shall be within the tolerances

specified. Wall thicknesses are minimum; a plus tolerance of 12 percent is permitted.

3.6.1 MINIMUM HYDROSTATIC BURST PRESSURE.—When tested in accordance with paragraph 4.2, the minimum allowable burst pressure at 73.4° F., shall be in accordance with table 2.

3.6.2 SUSTAINED PRESSURE.—When tested for 1,000 hours in accordance with paragraph 4.3 no crack, burst, leak, or any type of failure shall develop during this test and the outside diameter shall not increase more than 5 percent of the measured initial outside diameter while under stress.

3.7 UNIFORMITY.—The pipe shall be as uniform as commercially practicable in color or opacity, density, appearance, and other physical and chemical properties. It shall be homogenous throughout and free from visible cracks, holes, foreign inclusions, surface defects, or other injurious defects.

4. METHODS OF TEST

4.1 DIMENSIONS.—Any length of pipe may be checked for dimensions. Measurements shall be made at a temperature of 23° C. plus or minus 1° C., by a micrometer accurate to plus or minus 0.001 inch. Pipe shall be within the size tolerances specified herein.

4.2 TEST FOR MINIMUM HYDROSTATIC BURST PRESSURE (QUICK BURST).—Equipment and test method shall be as specified in Tentative Method of Test for Short-Time Rupture Strength of Thermoplastic Pipe, Tubing, and Fittings, ASTM Designation: D1599-58T. The test specimens shall be selected at random. Three specimens, each ten times the nominal diameter or a maximum of three feet in length, shall be tested individually in a horizontal position with water under a pressure that is increased at a rate which bursts the specimen within a period of 15 seconds. One end of the pipe shall be rigidly

TABLE 1.—Dimensions and Tolerances of Rigid AES Plastic Pipe, IPS Dimensions

Nominal pipe size (inch)	Outside diameters and tolerances (inch)		Series 40 (inch)	Wall thicknesses ¹ series 80 (inch)	Series 120 (inch)
1/4	0.405	±0.008	0.068	0.095	-----
1/2	0.540	±0.008	0.088	0.119	-----
3/4	0.675	±0.008	0.091	0.126	-----
1	0.840	±0.008	0.109	0.147	0.170
1 1/4	1.050	±0.010	0.113	0.154	0.170
1 1/2	1.315	±0.010	0.133	0.179	0.200
2	1.660	±0.012	0.140	0.191	0.215
2 1/2	1.900	±0.012	0.145	0.200	0.225
3	2.375	±0.012	0.154	0.218	0.250
3 1/2	2.875	±0.015	0.203	0.276	0.300
4	3.500	±0.015	0.216	0.300	0.350
5	4.000	±0.015	0.226	0.318	0.350
6	4.500	±0.015	0.237	0.337	0.438
	5.563	±0.030	0.258	0.375	0.500
	6.625	±0.035	0.280	0.432	0.562

NOTE.—The dimensions for these nominal pipe sizes conform to the dimensions used for iron and steel pipe with the exception that iron and steel pipe are not commonly made in pipe sizes 1/4" through 3 1/4", inclusive, in series 120. The industry does not recommend the threading of series 40 pipe.

¹ Wall thicknesses specified are minimum; a plus tolerance of 12 percent is permitted.

fitted to the pressurizing apparatus and the other end shall be free but supported at the free end. Care shall be taken to remove all air from the pipe before capping and testing. Any suitable closure that is free of leaks at maximum pressure may be used.

TABLE 2.—Minimum Hydrostatic Burst Pressure, psi at 73.4° F.

Size	Series 40	Series 80	Series 120
1/8	1,500	2,100	-----
1/4	1,450	1,975	-----
3/8	1,200	1,675	-----
1/2	1,150	1,575	1,800
3/4	950	1,300	1,450
1	900	1,225	1,350
1 1/4	750	1,025	1,150
1 1/2	675	950	1,050
2	575	825	950
2 1/2	625	850	925
3	550	750	900
3 1/2	500	700	775
4	475	675	875
5	400	600	800
6	375	575	750

TABLE 3.—Temperature Conversion Table ¹

Temperature ° F.	Conversion factor
60°	1.06
70°	1.01
73.4°	1.00
80°	0.96
90°	0.92

¹ The minimum hydrostatic burst pressure for temperatures other than 73.4° F. shall be obtained by multiplying the values in table 2 by the proper conversion factor given in this table.

The specimens shall be conditioned at 73.4° F., or at the test temperature if other than 73.4° F., for at least 2 hours before testing. If other temperatures are used, the minimum allowable burst pressure shall be corrected using the temperature conversion factor in table 3. The water temperature shall be within $\pm 3^\circ$ F. of the pipe conditioning and test temperature. All three specimens shall meet the requirements.

4.3 SUSTAINED PRESSURE TEST.—Equipment and test method shall be as specified in Tentative Method of Test for Time-to-Failure of Plastic Pipe Under Long-term Hydrostatic Pressure, ASTM Designation: D1598-58T. The test specimens shall be selected at random. Three specimens, each 10 times the nominal diameter in length or a maximum of 3 feet and containing the permanent marking on the pipe, shall be tested. These specimens shall be tested at a hoop stress of 1,700 psi for $1,000 \pm 1$ hours at $73.4^\circ \pm 3^\circ$ F. Water shall be used for the pressure medium. Any end fittings that fit the specimens without allowing leakage or other failure may be used.

The water pressure for the test shall be calculated from the actual dimensions of the specimen and the hoop stress by means of the following equation:

$$P = S \left(\frac{2t}{D} \right)$$

where S is the hoop or circumferential tensile stress in psi,
P is the water pressure in the pipe in psi,
D is the outside diameter in inches, and
t is the minimum wall thickness in inches.
All three specimens shall meet the test.

5. MARKING AND IDENTIFICATION

5.1 Each length of pipe shall be identified with a marking showing the symbol "ABS-IPS", the nominal size, the series, and a designation identifying the manufacturer, to be spaced at intervals of not more than 20 feet apart.

5.2 ABS pipe which is to be used for conveying potable water shall bear the "NSF" seal of the National Sanitation Foundation spaced at intervals specified in the NSF regulations. Manufacturers using the seal or NSF mark must obtain prior authorization from the National Sanitation Foundation, School of Public Health, University of Michigan, Ann Arbor, Michigan.

6. DECLARATION OF COMPLIANCE

6.1 In order that purchasers may be assured that the rigid ABS pipe actually complies with all requirements of this commercial standard, it is recommended that manufacturers include the following statement in conjunction with their names and addresses on labels, invoices, sales literature, etc.:

This rigid ABS plastic pipe is in accordance with Commercial Standard CS218-59, developed by the trade, under the procedure of the Commodity Standards Division and issued by the United States Department of Commerce.

7. EFFECTIVE DATE

7.1 Having met all procedural requirements of the Commodity Standards Division, including approval by the acceptors hereinafter listed, this Commercial Standard was issued by the United States Department of Commerce, effective from May 1, 1959.

EDWIN W. ELY,
Chief, Commodity Standards Division.

HISTORY OF PROJECT

In a letter dated June 12, 1957, The Society of the Plastics Industry, Inc., requested the cooperation of the Commodity Standards Division in the establishment of a Commercial Standard for rigid ABS plastic pipe (IPS dimensions). On June 27, 1957, copies of the Proposed Commercial Standard were distributed to representative organizations in the industry and to the National Bureau of Standards for comment. After adjustment in accordance with the consensus of all interested groups, the Recommended Commercial Standard was circulated to the industry for acceptance October 17, 1958.

On April 1, 1959, the Commodity Standards Division announced that acceptances had been received representing a satisfactory majority and that the Commercial Standard, to be designated CS218-59, would become effective May 1, 1959.

Project Manager: H. A. Bonnet, Commodity Standards Division, Office of Technical Services.

Technical Advisor: Dr. Frank W. Reinhart, Plastics Section, National Bureau of Standards.

APPENDIX I

SERVICE LIFE

Experience of the industry indicates that ABS Plastic Pipe meeting this specification in all respects will give satisfactory service over a long period of time. No short-time laboratory test that will reliably predict service-life has been developed to date. However, the Society of the Plastics Industry is conducting a research program to develop such a test, and it is the intention of the industry to revise this commercial standard to include a service-life test when one is available.

APPENDIX II

The following publications were used in compiling this specification:

1. "Kralastic Pipe—Tough, Rigid, Chemically Resistant" by P. M. Elliott, Naugatuck Chemical, Division of United States Rubber Company, Volume 11, Technical Papers, Society of Plastics Engineers.
2. "Wrought-Steel and Wrought-Iron Pipe", ASA B 36.10 - 1950, American Society of Mechanical Engineers.
3. "ASTM Standards on Plastics", ASTM Committee D-20 on Plastics, American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

STANDING COMMITTEE

The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, Office of Technical Services, United States Department of Commerce which acts as secretary for the committee.

H. M. McDANIEL, Republic Steel Corp., Republic Building, Cleveland, Ohio.

PAUL THOMAS, Asiatic Petroleum Corp., 50 West 50th St., New York, N.Y.

A. S. TRIPOLI, Triangle Conduit & Cable Co., Inc., Triangle and Jersey Avenues, New Brunswick, N.J.

JAMES G. WAITE, El-Mar Sales Co., Inc., 535 North Fourth St., Minneapolis, Minn.

TED M. YEISER, Crescent Plastics, Inc., 955 Diamond Ave., Evansville, Ind.

ACCEPTORS

The organizations listed below have individually accepted this standard for use as far as practicable in the production, distribution, purchase, or testing of rigid ABS plastic pipe (IPS dimensions). In accepting the standard, they reserved the right to depart from it as they individually deem advisable. It is expected that products which actually comply with the requirements of this standard in all respects will be regularly identified or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

ASSOCIATIONS

Society of the Plastics Industry, Inc., New York, N.Y.

FIRMS AND OTHER INTERESTS

Alpha Plastics, Inc., Livingston, N.J.
 American Brass & Iron Foundry, Plastics Division, Newark, Calif.
 American Hard Rubber Co., Butler, N.J.
 Bolta Products Division, General Tire & Rubber Co., Lawrence, Mass.
 Busada Manufacturing Corp., Flushing, N.Y.
 Carlson Products Corp., Aurora, Ohio.
 Chesdex Division, St. Regis Paper Co., Yonkers, N.Y.
 Dixie Plastics Manufacturing Co., New Orleans, La.
 Eclipse Plastic Industries, Inc., Sarasota, Fla.
 Evanite Plastic Co., Division of the Evans Pipe Co., Uhrichsville, Ohio.
 Franklin Plastics, Inc., Franklin, Pa.
 Industrial Plastic Fittings Division, The R&K Plastic Industries Co., Cleveland, Ohio.

Jessall Plastics, Kensington, Conn.
 Johnson Plastic Corp., Chagrin Falls, Ohio.
 Kansas State, Department of Administration, Purchasing Division, Topeka, Kans.
 Manufacturers Corporation of Ohio, Mansfield, Ohio.
 National Tube Division, United States Steel Corp., Pittsburgh, Pa.
 Patzig Testing Laboratories, Des Moines, Iowa.
 Plastex Co., The, Columbus, Ohio.
 Plastiline, Inc., White Plains, N.Y.
 Republic Steel Corp., Cleveland, Ohio.
 Sloane Manufacturing Co., Sun Valley, Calif.
 Texas Vitrified Pipe Co., Mineral Wells, Tex.
 Triangle Conduit & Cable Co., Inc., New Brunswick, N.J.
 Walworth Co., New York, N.Y.
 Western Plastics Corp., Hastings, Nebr.
 Yardley Plastics Co., Columbus, Ohio.

U.S. GOVERNMENT

Department of the Army, Standards Branch, Procurement Division, DCSLOG, The Pentagon, Washington, D.C.

OTHER COMMERCIAL STANDARDS

A list of Commercial Standards may be obtained from the Commodity Standards Division, Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. This list contains the purchase price of each publication and directions for ordering copies.

**ACCEPTANCE OF COMMERCIAL STANDARD
CS218-59, Rigid ABS Plastic Pipe (IPS Dimensions)**

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this Commercial Standard.

Date _____

Commodity Standards Division
Office of Technical Services
U. S. Department of Commerce
Washington 25, D. C.

Gentlemen:

We believe that this Commercial Standard constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production¹ distribution¹ purchase¹ testing¹
of this commodity.

We reserve the right to depart from the standard as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer _____
(in ink)

(Kindly typewrite or print the following lines)

Name and title of above officer _____

Organization _____

Street address _____ (Fill in exactly as it should be listed)

City, zone, and State _____

¹ Underscore the applicable words. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interest, trade associations, trade papers, etc., desiring to record their general support, the words "General support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial Standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of Commercial Standards is to establish, for specific commodities, nationally recognized grades or consumer criteria, and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the standard, where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function, performed by the Department of Commerce in the voluntary establishment of Commercial Standards on a nationwide basis is fourfold: First, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or of the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.